

BLIND CHILDREN; DEGREE OF VISION,
MODE OF READING: A 1963 REPLICATION

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Blind Children: Degree of Vision, Mode of Reading

A 1963 Replication

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IN 1961, JOHN W. JONES¹ of the U. S. Office of Education published a thorough analysis of the relationships between degree of visual handicap and mode of reading of legally blind children in the United States. This study was based upon data supplied by the American Printing House for the Blind which were obtained in 1961 through the registration of legally blind children under provisions of the Federal Act, "To Promote the Education of the Blind" (amended by Public Law 922, 84th Congress). The thought-provoking qualities of Jones's study have led to a demand that the study be replicated. The present report is in response to this interest and compares the data on enrollments of blind children as of January 1960 with those of January 1963.

PROCEDURE

As indicated above the basic data for both studies were obtained from the annual registration of legally blind children. The registration forms contain the name of the school system, the names* of legally blind children enrolled in the system, the grade level of each, the degree of vision in each eye with correction as reported by an eye specialist, and the reading medium employed by each child—braille, large type, or both. The children were assigned to visual categories on the basis of the corrected vision in the better eye. Other tabulations were made according to the categories *type of school system*, *grade level*, and *reading medium*. The analysis of the results of these tabulations largely follows that of the original study.

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* The identities of individual children registered as enrolled in educational programs throughout the United States are considered as privileged communications and are not available for public use.

LEVELS OF VISION

The system for categorizing students according to visual level and its rationale can best be described by quoting the original study:

Vision Level 1 contains children reported as having 20/200 visual acuity, the best or upper level of vision within the legal definition of blindness. Progressively diminishing levels of vision were established in order that data on reasonably large numbers of children with various degrees of remaining vision could be analyzed. It was considered important to attempt only to identify major trends and to keep the numbers of children at each level fairly large, even if this involved grouping together rather wide ranges of vision instead of grouping by each visual acuity reported. It was hoped that this procedure would increase the validity of the findings, since there was no way to verify how precisely the eye report information about the children was reported or how recently the eye examination on which these reports were based had been conducted.

Wide ranges of vision were reported in many different forms and for purposes of this study were tabulated on the basis of the corrected vision in the better eye and grouped as indicated below:

VISION LEVEL	VISUAL ACUITY OR DESIGNATION
I	20/200
II	15/200 and 20/300
III	10/200, 20/400, 15/300, 20/500, and 15/400
IV	20/600, 10/300, 15/500, 5/200, 10/400, 20/800, and 10/500
V	5/400, 10/800, 5/800, 5/500, 2/200, 1/300, to 1/500, 20/1,000 to 20/4,000 and 2/400
VI	Counts fingers
VII	Hand movement
VIII	Light perception
IX	Totally blind

A great variety of visual acuities were reported. For study purposes these were rounded and grouped according to the nearest classification:

2/200 includes all reported as either 1/200 or 2/200

5/200 includes all reported as 3/, 4/, 5/, 6/, and 7/200

10/200 includes 8/, 9/, 10/, 11/, and 12/200
 15/200 includes 13/, 14/, 15/, 16/, and 17/200
 20/200 includes 18/, 19/, and 20/200

The same pattern was followed for children tested on the 300-, 400-, 500-, 600-, and 800-foot symbols. Those reported within the 20/1,000 to 20/4,000 range were grouped together because of their small numbers.

The *counts fingers* category (Vision Level VI) includes those reported as such or for whom the notation "C.F." was made. Children classified under *hand movement* (Vision Level VII) include those reported as being able to distinguish hand movements or those for whom the notation "H.M.," gross form, object perception, or light projection was made. Tabulations were made of the distances at which children were able to count fingers and perceive hand movements. Resulting subclassifications contained so few children in each, however, that valid generalizations based on such small groups could not be made. It was impossible, also, to determine to what extent eye specialists had attempted to ascertain the distance at which each child could count fingers or perceive hand movements or whether such findings had been reported if they were available. The vast majority of children in the *hand movement* level were reported, for instance, only as perceiving hand movements; distance was not specified.

The *light perception* vision level includes those children reported with this notation or for whom, "L.P." was listed. This level may include some with light projection, inasmuch as it was not possible always to differentiate between the two on the basis of the information in some of the reports. The classification *totally blind* contains those so reported and those with such notation as: "none," "enueleated," and "prosthesis."

In 1963, 138 children were registered as having restricted fields as compared to seventy-four in 1960. As before, this group was not included in the analysis as a separate level of vision. No separate tabulation of these children was made in the present study.

In 1960, "approximately 450 registrants were not included in the tabulations because they could not be fitted into one of the classifications." In 1963, the number rose to 552. This group included students whose vision was reported in unusual or ambiguous terms, who were clearly identified on the registration forms as deaf-blind, cerebral palsied or mentally retarded, or those for whom the grade level was ambiguous. In 1963, after removal of adult rehabilitation cases, the total registration of legally blind children was 17,110 as compared to the 14,574 reported in the initial study. This constitutes an increase in registration over a three-year period of 2,536 children. In 1963, 9,438 children were enrolled in local school programs as compared to 7,366 in 1960. A similar comparison for residential schools is 7,672 children in 1963, and 7,208 in 1960.

MAJOR FINDINGS ON VISUAL LEVELS

Table 1 presents a comparison of the proportion of *legally blind* children falling in each visual category for each of the years studied. In this table, as in others, all proportions have been rounded to the nearest one-hundredth and as a consequence the total sums for the proportions may fail to equal one exactly. A quick inspection of this table reveals that the distribution of proportions is essentially the same for the two years. There is a decrease of 2 per cent in the relative proportion of children registered as totally blind and an increase of 3 per cent in the number of children registered as having vision of 20/200. Smaller fluctuations can be noticed in some of the categories. None of these shifts appears large enough to have practical significance.

TABLE 1
Comparison of Distributions of Degree of Vision

	Visual Categories								
	I	II	III	IV	V	VI	VII	VIII	IX
1960	.31	.04	.09	.04	.02	.06	.03	.16	.24
1963	.34	.05	.09	.05	.01	.06	.03	.15	.22

Table 2 is a comparison of the proportion of local and residential students by degrees of vision for the years 1960 and 1963. Again there is little change in the distributions over the three-year period. It does appear that the decrease in totally blind children has occurred primarily in the residential schools and that the increase in children reported as having 20/200 vision has occurred primarily in the local schools. Reasons for this are not apparent in the data.

TABLE 2
Comparison of Local and Residential School Registrants by Degrees of Remaining Vision

	Visual Categories								
	I	II	III	IV	V	VI	VII	VIII	IX
1960									
Local	.43	.05	.10	.05	.01	.04	.02	.11	.18
Resident	.17	.03	.08	.04	.02	.09	.05	.22	.30
1963									
Local	.46	.05	.10	.04	.01	.04	.02	.10	.18
Resident	.18	.04	.08	.05	.02	.09	.05	.21	.28

The tendency for children of greater visual acuity to be enrolled in local school programs and those of less visual acuity to be enrolled in residential programs is almost identical for the two periods. However, both systems still must meet the requirements of designing programs which will accommodate wide ranges of residual visual abilities.

TABLE 3
COMPARISON OF DISTRIBUTIONS OF MODE OF READING BY VISUAL CATEGORIES

	Visual Category									
	I	II	III	IV	V	VI	VII	VIII	IX	Total
	<i>1960</i>									
Braille	.12	.26	.32	.45	.64	.71	.91	.99	1.00	.58
Large Type	.82	.68	.59	.46	.31	.24	.07	.01	.00	.38
Both	.06	.06	.09	.09	.05	.05	.02	.00	.00	.04
	<i>1963</i>									
Braille	.09	.15	.24	.43	.71	.64	.91	.98	.99	.53
Large Type	.86	.77	.67	.47	.22	.28	.06	.02	.00	.43
Both	.05	.08	.09	.10	.07	.07	.03	.07	.00	.04

As Jones commented previously (pp. 21-22) the peculiar U-shaped forms of the distributions probably reflect lack of validity in the data as the result of variations in recency of eye examinations, heterogeneity among communities and states in standards for eye examinations and myriad other reasons.

MODE OF READING IN RELATION TO DEGREE OF VISION

Given in Table 3 is a comparison for 1960 and 1963 of distributions of modes of reading by visual categories. As before we find the degree of residual vision related to the reading medium: the greater the remaining vision the greater the tendency to read print and the less the remaining vision the greater the tendency to read braille.

Inspection of the total proportions reading each medium reveals a decrease of 5 per cent in the proportion of students reading braille and an increase of 5 per cent in the proportion reading large type. Further inspection of the table indicates that the shift from braille to large type occurred primarily among readers falling within visual categories II and III where the shift to large type is of the order of 8 per cent to 9 per cent. A shift of 8 per cent is also apparent for readers in visual category VIII; however, here the shift is toward reading both media.

TABLE 4
COMPARISONS OF PROPORTIONS OF LARGE TYPE READERS BY VISUAL LEVEL FOR LOCAL AND RESIDENTIAL SCHOOLS

	Visual Level								
	I	II	III	IV	V	VI	VII	VIII	IX
	<i>1960</i>								
Local	.92	.83	.77	.65	.50	.44	.18	.01	.00
Resident	.50	.29	.30	.20	.14	.14	.02	.00	.00
	<i>1963</i>								
Local	.92	.86	.80	.60	.38	.50	.13	.04	.01
Resident	.65	.61	.45	.32	.12	.16	.03	.00	.00

Table 4 compares the proportions of large type readers in each visual category for local and residential schools in 1960 and 1963. While differences

as large as 12 per cent exist in proportions of print readers falling within distinct visual categories for local school students, no systematic change is apparent over the three-year period. The observer may raise an eyebrow over the one per cent of local school students in category IX (totally blind) who are listed as print readers. Depending on whether his outlook is optimistic or pessimistic, he may view this either as evidence for the occurrence of a minor miracle in the public schools or evidence of lack of validity in the reports for this group.

Inspection of similar data for the residential schools reveals a shift from braille to print reading in six of the nine visual categories. This shift is quite dramatic, ranging from 12 per cent to 32 per cent in visual categories I-IV. This shift is also demonstrated by the data in Table 5 which allow comparison of proportion of braille readers by visual level for local and residential schools.

TABLE 5
COMPARISON OF PROPORTIONS OF BRAILLE READERS BY VISUAL LEVEL FOR LOCAL AND RESIDENTIAL SCHOOLS

	Visual Levels								
	I	II	III	IV	V	VI	VII	VIII	IX
	<i>1960</i>								
Local	.05	.13	.16	.28	.42	.52	.78	.99	1.00
Resident	.35	.62	.58	.69	.84	.80	.97	.99	1.00
	<i>1963</i>								
Local	.04	.08	.12	.29	.58	.41	.82	.94	.99
Resident	.25	.28	.44	.59	.79	.78	.95	.99	1.00

No systematic changes in proportions of students' reading in both media at the several visual levels for either local or residential schools are found between the years 1960-1963. However, the data in Table 6 indicate that differences previously reported between local and residential schools have diminished.

In Table 7, local and residential schools are compared for the years 1960 and 1963 for proportions of students having vision of object perception or better (categories I-VII) and vision of light perception or worse (categories VIII and IX). When populations are divided in this manner, little difference

TABLE 6
COMPARISON OF PROPORTIONS OF STUDENTS READING BOTH
BRAILLE AND LARGE TYPE IN EACH VISUAL CATEGORY

	Visual Category								
	I	II	III	IV	V	VI	VII	VIII	IX
1960									
Local	.03	.04	.07	.07	.08	.04	.04	.00	.00
Resident	.15	.09	.12	.11	.02	.06	.02	.00	.00
1963									
Local	.04	.06	.08	.11	.05	.09	.04	.02	.00
Resident	.10	.12	.11	.09	.08	.06	.02	.00	.00

TABLE 7
COMPARISON OF LOCAL AND RESIDENTIAL SCHOOLS FOR PROPORTIONS OF STUDENTS HAVING VISION OF OBJECT PERCEPTION OR BETTER AND VISION OF LIGHT PERCEPTION OR WORSE

	Visual Categories			
	I-VII		VIII-IX	
	1960	1963	1960	1963
Local	.71	.72	.29	.28
Resident	.48	.50	.52	.50

is apparent among the data from the different years. School populations appear stable in this respect.

The proportions of students in local and residential schools who possess object perception or better are reported according to reading media for the years 1960 and 1963 in Table 8. For local school systems, the data for the two reporting periods are essentially the same. In the case of residential school programs, a shift of 12 per cent from braille to print reading is apparent.

TABLE 8
COMPARISON OF MODES OF READING OF STUDENTS WITH
VISION OF OBJECT PERCEPTION OR BETTER IN
LOCAL AND RESIDENTIAL SCHOOLS

	Braille	Large Type	Both
1960			
Local	.14	.82	.04
Resident	.61	.29	.10
1963			
Local	.12	.83	.05
Resident	.49	.42	.09

The great differences between local and residential school systems in the proportions of children in visual categories I-VII reported as reading print was a matter of concern in the 1960 study. It is encouraging

to see evidence of a strong tendency in the residential schools toward making a more realistic match between degree of residual vision and reading medium. No doubt many factors have been influential in stimulating this shift. Among these are undoubtedly the influence of the 1961 report, greater knowledge and emphasis on visual efficiency, use of vision and optical aids and greater stress on adequate individual diagnosis and treatment.

GRADE DISTRIBUTIONS

The distributions by grade for blind students for the years 1960 and 1963 and for total United States school enrollment for the years 1958-1959 (Schloss, et al., 1961)² are compared in Table 9. The 1963 data for the blind appear to more closely resemble those for the United States total enrollment than was the case in 1960. Also shown in this table are the proportions of blind students reported as ungraded. This proportion increased by 33 per cent (from .06 to .08) over the three year period dividing the studies, with 1,348 blind children reported as "ungraded" in 1963.

Grade distributions for total U. S. enrollment and braille readers and print readers in 1960 and 1963 appear in Table 10. These distributions resemble each other quite closely with the exception that much higher proportions of students appear in kindergarten and grade 1 in 1960. This phenomenon was specifically pointed out by Jones (pp. 27-28) and its possible cause listed. Among these was mental retardation. The 1963 data suggest that mental retardation may have been a principal cause. While no change in proportion of "ungraded" students was reported for print readers, the proportions of braille readers classified thus rose from .06 in 1960 to .09 in 1963, an increase of 50 per cent. It is suggested that an accumulation of children of low academic aptitude was partially responsible for the pile-up of braille readers in kindergarten and grade 1. The pressure generated by this pile-up caused the dramatic increase of 50 per cent in the proportion of braille readers who were classified as "ungraded." However, this cause could account for only about

TABLE 9
COMPARISON OF GRADE DISTRIBUTIONS OF BLIND STUDENTS AND
TOTAL ENROLLMENT IN U. S.

	Grade Level												
	K.	1	2	3	4	5	6	7	8	9	10	11	12
Total US (1958)	.05	.10	.10	.09	.09	.09	.09	.08	.07	.07	.07	.06	.04
Blind (1960)	.07	.15	.11	.10	.08	.08	.07	.07	.05	.05	.04	.03	.06
Blind (1963)	.03	.09	.09	.11	.11	.09	.08	.07	.06	.06	.05	.04	.08

TABLE 10
COMPARISON OF GRADE DISTRIBUTIONS OF READERS OF PRINT AND
BRAILLE AND TOTAL ENROLLMENT IN U. S.

	Grade Level													
	K	1	2	3	4	5	6	7	8	9	10	11	12	Ung.
Total US (1958)	.05	.10	.10	.09	.09	.09	.09	.08	.07	.07	.07	.06	.04	
Braille (1960)	.10	.18	.11	.10	.08	.07	.06	.06	.04	.04	.04	.03	.03	.06
Print (1960)	.02	.10	.11	.11	.10	.10	.09	.09	.06	.05	.05	.03	.03	.06
Braille (1963)	.05	.09	.09	.11	.11	.09	.08	.06	.05	.05	.05	.03	.03	.09
Print (1963)	.01	.08	.09	.11	.11	.10	.09	.07	.07	.07	.06	.04	.03	.06

TABLE 11
COMPARISON OF GRADE DISTRIBUTIONS OF READERS OF BOTH PRINT AND
BRAILLE AND TOTAL ENROLLMENT IN U. S.

	Grade Level													
	K	1	2	3	4	5	6	7	8	9	10	11	12	Ung.
Total US (1958)	.05	.10	.10	.09	.09	.09	.09	.08	.07	.07	.07	.06	.04	
Both (1960)	.03	.11	.07	.08	.08	.07	.09	.12	.06	.07	.06	.04	.04	.07
Both (1963)	.01	.06	.09	.10	.10	.08	.09	.08	.06	.08	.05	.05	.07	.06

TABLE 12
COMPARISON OF GRADE DISTRIBUTIONS FOR LARGE TYPE READERS IN
LOCAL AND RESIDENTIAL SCHOOLS

	Grade Level													
	K	1	2	3	4	5	6	7	8	9	10	11	12	Ung.
<i>1960</i>														
Local	.02	.10	.12	.11	.10	.11	.09	.08	.06	.05	.04	.03	.02	.06
Resident	.04	.10	.07	.08	.08	.08	.09	.10	.06	.07	.06	.04	.03	.09
<i>1963</i>														
Local	.01	.08	.10	.12	.11	.10	.09	.07	.07	.06	.05	.04	.03	.06
Resident	.02	.08	.08	.09	.08	.08	.09	.08	.06	.07	.08	.05	.04	.08

50 per cent of the children involved. Some of this group appear to have progressed normally to grades 3 and 4 since these two grades contain a larger proportion of children in 1963 than do the others. Some have undoubtedly been transferred to other types of programs.

A similar comparison involving readers of both braille and print is given in Table 11. The 1960 and 1963 distributions resemble one another closely and do not depart radically from the distribution for total enrollment, or from the 1963 distributions for braille readers and print readers.

Table 12 compares grade distributions for large type readers in local and residential schools for 1960 and 1963. The differences between the distributions for local and residential schools appear to be fewer in 1963 than in 1960.

SUMMARY OF DIFFERENCES: COMPARISON OF 1960-1963 DATA

1) The total number of legally blind children registered with the American Printing House increased by 2,536 children during the period. Of these, 2,072 were enrolled in local school programs and 464 were enrolled in residential school programs.

2) Between 1960 and 1963 the percentage of students listed as braille readers decreased 5 per cent and the percentage of students listed as print readers increased 5 per cent. This appears due primarily to a dramatic increase in the proportions of residential school students in visual categories I-IV who are listed as print readers.

3) In 1963, 12 per cent more residential school students possessing object perception or better were registered as print readers.

4) The number of legally blind students classed

as ungraded in 1963 was 1,348. This was a 50 per cent increase over the number of students so reported in 1960.

5) The accumulation of braille readers in kindergarten and grade 1, so evident in the 1960 data, does not occur in the 1963 data. The 50 per cent increase in the number of braille readers classed as "ungraded" suggests that this peak in the 1960 distribution for grades was partly the result of an accumulation of children of limited academic aptitude.

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